

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

In the Matter of	)	
	)	
NUCLEAR ENERGY INSTITUTE	)	
and	)	WT Docket 09-176
UTILITIES TELECOM COUNCIL	)	ET Docket No. 05-345
	)	
Request for Waiver to Permit The Use of	)	
Two-Way Wireless Headsets and Intercom	)	
Intercom Devices Inside Nuclear Facilities	)	

To: Chief, Wireless Telecommunication Bureau

**REPLY COMMENTS OF THE NUCLEAR ENERGY INSTITUTE**  
**AND UTILITIES TELECOM COUNCIL**

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Dated: November 5, 2009

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## **SUMMARY**

The Nuclear Energy Institute (“NEI”) and Utilities Telecom Council (“UTC”) (collectively, the “Petitioners”), on behalf of their members that own and operate the nation’s nuclear power generation facilities, seek waiver of Parts 2 and 90 of the FCC’s Rules in order to permit commercial nuclear power plants to obtain licenses under Part 90 in order to continue to use two-way wireless headset equipment for indoor communications requirements.

As described more fully in the waiver petition (“Petition”), the equipment at issue, manufactured by Telex Communications, Inc., significantly contributes to minimizing radiation exposure of workers and ensuring the safe handling and movement of nuclear fuel. The Telex equipment is used primarily, although not exclusively, during the approximately month-long process of refueling nuclear power reactors, which occurs at each reactor every 18-24 months. The Telex equipment operates at extremely low power, in the cluttered, equipment-filled, nuclear power plant environment, mostly on large campuses, located substantial distances from potential licensees of this spectrum.

The plants need this regulatory relief because the Telex equipment has proven exceptionally capable of providing reliable worker-to-worker communications inside the challenging environment of the plant’s buildings, many of which have thick, rounded walls and ceilings, and where plant workers must operate around dozens of other mechanical operating systems, including dosimeters that must be worn by the plant workers at the same time as they wear the Telex headsets.

Finding a replacement for the Telex equipment has been a priority for the plants over the past five years. Indeed, 55 plants have tested 29 different potential alternatives. None are able to provide the Requisite Performance Features, as described in the Petition, that the plants have

found in Telex, and that they have come to rely upon to operate the plants safely and to protect worker health and safety.

Commenting in opposition to this request are CTIA, Verizon, and the Engineers for the Integrity of Auxiliary Service Spectrum (“EIBASS”). CTIA and Verizon take similar paths to their conclusion that the Petition should be rejected, emphasizing the need for integrity in the clearing of the 700 MHz spectrum for public safety and commercial licensees, and challenging the plants’ failure to prove a negative: that secondary licensing would not interfere with the 700 MHz licensees.

EIBASS joins in opposition, using strident language that suggests that they may be more upset about Telex and other recent Commission actions, than they are about the merits of this Petition. EIBASS also expresses incredulity that no alternative equipment is available, but then fails to offer any equipment suggestions that the plants have not already tested and found wanting in material respects.

The Petitioners and the plants are equipment agnostic and do not carry any portfolio for Telex. Indeed, finding a suitable alternative that could satisfy the Requisite Performance Features would be the best alternative for the plants, however, as set forth in the Petition and restated here, it simply does not exist.

Grant is in the public interest because, as detailed herein, the plants need equipment that includes the Requisite Performance Features found in the Telex equipment, in order to meet the NRC’s regulatory requirements. Given the fact that these licenses, if granted, would confer only secondary license authority, and given the demonstrated non-interference to the broadcast spectrum together with the extraordinary unlikelihood of interference to the 700 MHz licensees, the Petitioners respectfully urge the Commission to grant the Petition.



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**REPLY COMMENTS OF THE NUCLEAR ENERGY INSTITUTE**  
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In accordance with FCC Public Notice, DA-09-2171A1, released October 5, 2009, the Nuclear Energy Institute ("NEI") and Utilities Telecom Council ("UTC") hereby reply to the opposing comments filed in the captioned proceeding by the CTIA, Verizon, and Engineers for the Integrity of Broadcast Auxiliary Service Spectrum (EIBASS).<sup>1</sup> For the reasons set forth below, the Petitioners respectfully submit that the Opponents have failed to rebut or undermine the reasoned justifications for the captioned waiver petition ("Petition"). Therefore, the Commission should promptly grant the Petition.

**I. Background - History and Context of Use.**

In assessing the validity of the Opponents' arguments, the Commission must recall the background history and context of the Petition. In April 2003, the Commission issued the first in

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<sup>1</sup> Comments in support of the Petition were filed by Ameren Services Company; Southern Company Services; Arizona Public Services; and Dominion Resources Inc, collectively referred to as the "Proponents" herein. Those filing opposing comments are collectively referred to herein as the Opponents.

a series of Special Temporary Authorizations relating to nuclear plant use of the Telex Communications, Inc. (“Telex”) equipment at issue.<sup>2</sup> In November of 2004, the Commission declined to grant Telex a permanent waiver request because, at that time, such a waiver was “not supported by the record currently before us.”<sup>3</sup> However, the Commission granted an identical STA to the NEI in April of 2005 and renewed that STA in October of 2005. Thereafter, the Commission issued to the plants, directly, two rounds of experimental licenses, the most recent of which will expire on February 17, 2010.

During this entire period – now over six years – there was no opposition raised to the Commission by the Opponents or any others against the Commission’s initial and continued grant of the STAs or the experimental licensees. Nor, to the Petitioners’ knowledge, have there been any reported incidents of harmful, or for that matter any interference with the operations of licensed users of the relevant spectrum. The Opponents point to none.

As outlined in the Petition,<sup>4</sup> and reinforced by the comments of Proponents, use of Telex equipment occurs at a limited number of locations around the country. These plant locations (ranging in size from 400 to 1000 acres) are large sites, with multiple concrete and hardened structures. The vast majority of the plants are not proximate to major cities or other areas of highly concentrated population.<sup>5</sup> The use of the Telex equipment is intermittent and periodic, concentrated during refueling outages when, among other maintenance and refurbishment

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<sup>2</sup> The initial STA was granted to Telex Communications, Inc., the manufacturer, of the equipment, in early April 2003 and was subsequently extended ultimately through April 7, 2005. See *In the Matter of Telex Communications, Inc.*, DA 04- 3691, 19 FCC Rcd. 23169 at ¶2, n. 6 (2004), (“Telex Order”).

<sup>3</sup> *Telex Order*, ¶ 8.

<sup>4</sup> Petition, at pp. 5-8.

<sup>5</sup> Even the maps attached to the EIBASS’s Comments as Figure 2A-2H generally show several miles or more to the nearest communities listed on the map.

activities, “spent” nuclear fuel is removed and replaced with “fresh” fuel. These outages can last approximately 37-40 days. The Telex equipment is operated at decidedly low power levels; less than 100 mW. Access to and use of the equipment is carefully controlled by the nuclear plant operators.<sup>6</sup> Finally, and most importantly, the Telex equipment contributes substantially to the reduction in plant workers’ exposure to radiation, consistent with NRC regulations, and to safe plant operations.

Thus, after 6 years of non-interference resulting from indoor and outdoor operation at the plants – and since there is no suitable alternative – the plants now seek a more stable and longer-term operating authority than can be provided through experimental licensing. As noted above, the plants are equipment agnostic. While Petitioners and the plants would prefer to have equipment with the Requisite Performance Features operating in other frequency bands, the *reality* is that the market has not responded with such specialized equipment operating on traditional Part 90 narrowband frequencies.

In framing this request for secondary licensing authority, Petitioners recognized that a portion of the relevant spectrum band had been reallocated to the 700 MHz licensees, and therefore elected to reduce their request from the current usage levels permitted under the experimental licenses (indoor and outdoor use) to indoor only, in order to provide even greater assurance to broadcast and 700 MHz licensees that these headsets will pose no realistic threat of interference to their operations.

This effort to work collaboratively has been the hallmark of Petitioners’ efforts for the past six years. Indeed, at each step in its discussions with the Commission and the licensees, Petitioners have agreed to reduce the geographic scope of the plants use of the Telex equipment:

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<sup>6</sup> In the *Telex Order*, the Commission had questioned its ability to rely on Telex’s statements and representations on this subject. *Telex Order*, ¶ 6. Such is not the case here as it is the nuclear plant operators themselves who are directly relating their practices and to whom the licenses would be granted, should the Petition succeed.

first limiting use to only inside the plant's fenced perimeter; then, under the Consensus Plan negotiated with NAB, MSTV and Society of Broadcast Engineers ("SBE"), limiting outdoor use upon frequency coordination; and now tightening the aperture further, limiting use to indoor plant operations only. This is the very minimum usage that will enable the plants to comply with the NRC's standard which requires that radiation doses at the plants are "as low as reasonably achievable," which is known by its acronym ALARA.

Specifically, the ALARA standard requires that plants make "every effort to maintain exposure to radiation as far below the dose limits in this part as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to the benefits to the public health and safety, and other societal and socioeconomic considerations, in relation to the utilization of nuclear energy and licensed materials in the public interest." 10 CFR Section 20.1003 et seq.

## **II. Supporting Comments from the Plants Further Make the Case.**

The plants are, of course "on the ground." Their strong support is most relevant to this discussion. They are the ones who understand how well the Telex equipment works in this unique and challenging setting. They are the ones who have tested the "potential alternatives." They know that workers can operate more efficiently with the Telex equipment, thus reducing worker doses of radiation and increasing plant safety.

Proponent Dominion Resources Services, Inc. declares that "unlike Part 90 equipment, such as belt-style UHF communications systems, Telex equipment avoids inadvertent actuation of other power station equipment. Telex is also far easier to configure and operate than these other systems." *See* Dominion Comments at p. 3. In fact Dominion "once abandoned a different system during a refueling outage in favor of the Telex system because of the initial system's lack of functionality, limited range, and interference problems." *Id.* For similar reasons, Proponent

Southern Company Services, Inc. states that use of Telex equipment enables their Health Physics staff “to remotely monitor and communicate with workers conducting maintenance in high radiation areas.” *See* Southern Comments at p. 4. This enables Southern “to ensure that its plant workers’ exposure to doses of radiation are “as low as reasonably achievable, in compliance with NRC regulations.” *Id.*

Also in this context, Proponent Ameren Services Company notes that it has “spent considerable time and resources investigating several different wireless systems to determine if those systems could, whether operating alone or in conjunction with other new equipment, satisfy the requirements of Ameren, during an outage. In each case, the alternative system was deemed unable to fill the performance and reliability Ameren experiences with Telex equipment.” *See* Ameren Comments at p. 7. Similarly, Arizona Public Service Company (“APS”) observes that “each of the Requisite Performance Features are critical to safe and efficient operation within the containment areas...” and that “no Part 90 equipment currently on the market is capable of meeting these requirements.” *See* APS Comments at p. 3.

Additional “on the ground” reports from the plants regarding the importance of the Telex equipment to their communications requirements are included in the Petition. Accordingly, the Proponents’ comments regarding the critical need for Telex equipment and the lack of any alternative is entirely consistent with the assertions of the Petitioners.

### **III. Opposition is Based on a False Premise and Mischaracterizes the Petition.**

CTIA and Verizon start from a false premise, apply the wrong analysis and therefore arrive at an incorrect conclusion. The notion that wireless microphones and the Commissions handling of them in the 700 MHz context, should be the guidepost for evaluating the plants request to be permitted the right to be a secondary licensee in the spectrum band fails to appreciate the extraordinary differences of these two communications devices and these vastly

different circumstances. First, the instant request would enable the nations' nuclear plants to operate with greater safety and limit the radiation dose exposure of the plants' workers, thus complying with the letter and spirit of the NRC's ALARA standard. There are a finite number of such plants, and they are generally located in remote areas. Also, nuclear plants are among the most tightly regulated and regimented settings in the country, with access and operation tightly restricted and monitored. Finally, the use of the Telex equipment by the plants will itself be strictly limited and tracked. Thus, as licensees, in the event that there is ever a need to determine the source of interference, change frequencies, or terminate use of the equipment, it will be easily accomplished via referencing the FCC's database. In contrast, wireless microphones are potentially ubiquitous, largely unregulated, entirely unlicensed, and arguably not as essential to the nation's critical infrastructure and the public safety.

In addition, Opponents raise concern over the risk that first responders arriving at an "incident" at a nuclear plant would find their radios blocked by interference from the plants use of the Telex equipment, especially if the "incident" occurred during an "outage" that occurs every 18-24 months and runs approximately 37-40 days. Yet, in the unlikely event of such incident, it is unlikely that the plant workers would be continuing their activities inside the reactor plant or other critical area that emergency workers might seek to enter. Further, in the tightly controlled environment of a nuclear plant, if there were any continuing Telex operation and any question of interference, such operation could be required to cease and such requirement could and would be implemented immediately. That ultimately the determining issue here should be one of public health and safety is not a matter in dispute. What Opponents fail to grasp is that communications inside the plant over Telex equipment is essential to that mission. Tightly

restricted and controlled, as herein proposed, the plants use of the Telex equipment does not conflict with other public safety missions.<sup>7</sup>

EIBASS's Comments closely track those filed by SBE back in 2005, employing a similarly harsh tone to challenge the plants' continued use of this equipment on a non-interfering, secondary basis, for indoor-only operation. Substantively, EIBASS takes the Petitioners to task over the requested licensing, "since neither NEI nor UTC are the owner or operators of NPPs, EIBASS questions how either group can provide assurances as to the practices of persons who are not its employee and not under its supervision." EIBASS Comments at p. 3. EIBASS goes on to note that "it is only the individual NPP operators who would be in a position to give such assurances." *Id.* Petitioners agree entirely: that is why the Petition requests that each plant would apply for its own secondary license if the Petition is granted. *See* Petition at p. 22.

EIBASS also clearly has a problem with Telex, pointing to the Telex website as a basis for challenging the plants' promise to use the Telex equipment only indoors (and ignoring the fact that, currently, the experimental licenses allow both indoor and outdoor use). As noted above, the plants are agnostic when it comes to equipment.

The plants care only that the Telex equipment satisfies their communications requirements and that it lowers worker exposure to radiation and increases plant operating safety. If there were another useful alternative, the plants would transition. Clearly, the plants relentless testing of 29 potential alternatives is a good faith demonstration of this fact. Just as clearly, as Motorola told Petitioners, the plants do not represent a large enough potential market to justify Motorola's investment in developing and producing equipment for the plants. Accordingly, the

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<sup>7</sup> Petitioners note that MSTV, NAB, and SBE, (the opponents to Petitioners' initial 2005 waiver filing and parties to the 2007 Consensus Plan) have not filed oppositions to the Petition.

plants have taken appropriate steps to find alternative equipment and now find themselves without any reasonable alternative.

Opponents also wrongly dismiss the plants' proffer to limit use of the Telex equipment to inside operations. They just either claim (recklessly and without basis) that the plants would violate the terms of the license (EIBASS), or they argue that the indoor/outdoor restriction "may be less relevant now as well" (Verizon), but do not say why. It is Petitioners' view that they do not go further because they cannot. The Consensus Plan, and 5-6 years of non-interference operation are the undeniable proof of non-interference in the future.

And, to the extent that CTIA and Verizon are concerned about interference from the plants' operations of the Telex equipment, we contend that the fact that much of the equipment is frequency agile and that, together with the fact that this use will be indoors and at a relatively small number of fixed location, at low power, the relative risk of interference is reduced dramatically. To the extent that CTIA and Verizon worry over the chance that *their* operation could interfere with the plants' use of the Telex equipment, as noted earlier, the plants fully recognize that as secondary licensees they have no expectation of protection from interference by the primary licensees.

Indeed, this situation is analogous to the 1995 case in New York City, where the Commission conditionally waived the Part 2 and 90 rules to allow New York City area public safety agencies to use television Channel 16 after determining that such arrangement "could be concluded without affecting the existing television operations." The FCC specifically conditioned the waiver on the adjacent channel broadcaster having no responsibility to protect the public safety users except for spurious emissions that would exceed those permitted under the FCC's Rules, and on the public safety agencies having an affirmative obligation to avoid causing



interference to adjacent channel broadcast reception. *See Waiver of Parts 2 and 90 of the Commission's Rules to Permit New York Metropolitan Area Public Safety Agencies to Use Frequencies at 482-488 on a Conditional Basis*, Order, 10 FCC Rcd 4466 (1995). Ten years later, the Commission acknowledged that "Channel 16 has successfully coexisted with television operations" and that "the public interest would be served by changing the temporary authorization to a permanent allocation." *Id.*

To the extent that CTIA and Verizon share a common worry that the plants, despite the strictly regulated arena in which they work, would nevertheless elect to operate outside of the restrictions placed on them by the FCC is unsupported by the record. The very fact that the plants came forward voluntarily a number of years ago to work with the FCC and stakeholders regarding the use of this equipment sets them apart from the untold thousands of entities that are believed to be using the same equipment in uncontrolled environments.

CTIA and Verizon also argue that grant of the Petition would be inconsistent with the FCC's stated objective of clearing the 700 MHz band in order to enable the Public Safety and commercial operators to fulfill their operational objectives. Petitioners note that this is the reason that the FCC has waivers; to allow for some flexibility, as well as to maximize the efficient use of spectrum when the Commission determines that the facts and circumstances merit that outcome. Petitioners have demonstrated unique circumstances and a lack of alternatives, such that a waiver of the rules is appropriate. Opponents' concern that this would create a precedent that would interfere with clearing the 700 MHz band is therefore unfounded. Moreover, these concerns are not a sufficient reason to deny the plants the use of the Telex equipment that contributes substantially to the reduction in plant workers' exposure to radiation, consistent with NRC regulations, and to safe plant operations.

**IV. Indoor-Only Use Matters, as Does the Critical Infrastructure Use of the Telex Equipment.**

It is not often that one can point to six years of interference-free operation in support of the requested relief. Notwithstanding this fact, Proponents have limited the Petition to “indoor only” as an additional concession to any potential concern about interference. Despite the merits of the Petition and the absence of any interference, CTIA and Verizon have opposed the Petition solely to preserve the “pristine” character of the 700 MHz spectrum. This is unfair and unrealistic. It unfairly prevents plants from continuing to operate on a secondary basis, even though they pose no realistic threat of interference. Meanwhile, it is unrealistic because the band will likely be littered with Part 15 devices that represent a far greater potential of interference, just by their sheer numbers. This unrelenting posture is unfortunate because CTIA and Verizon appear to be willing to deny the plants access to an admittedly critical communications tool and thereby jeopardize safety of the plants and plant personnel as a matter of principle, in order to accomplish this purist objective.

Petitioners respectfully assert that low power, intermittent use of the Telex equipment, limited to the defined locations of the U.S. nuclear plants, does not constitute a real risk to the 700 MHz operators, and that the unsupported assertion that such use might interfere (or unsubstantiated accusations that highly regulated plants would nevertheless use the Telex equipment outdoors, even if not permitted under their authorizations) is an insufficient basis for denying this crucial communications platform. Should there occur that once in a life time event, such as the one raised by CTIA and EIBASS, where emergency responders rushing to assist with an incident at a plant only to find that their radios are ineffective due to interference with the Telex equipment being operated at the plant, the plants’ Telex equipment would have to be turned-off from any interfering frequency. Further, unlike less controlled environments, a

requirement to avoid interference could and would be implemented immediately. Indeed, beyond a desire to maintain a virtually pristine spectrum horizon, Petitioners are hard-pressed to really understand the specific reason for any objection to allowing the plants the opportunity to use the Telex equipment to enhance plant and worker safety, and thereby meet the NRC standards.

It also bears noting that the FCC is directed, under Section 1 of the Communications Act of 1934, as amended, to provide for the use of radio for, among other things, the purpose of promoting safety of life and property. In addition, Congress has determined that the private internal radio communications services used by electric utilities constitute “public safety radio services” because they are used to protect the safety of life, health and property. 47 U.S.C. Section 309(j)(2). *See also* H.R. Conf. Rep. No. 105-217, 105<sup>th</sup> Cong., 1<sup>st</sup> Sess., at 572 (1997) (public safety radio services include private internal radio services used by “utilities, railroads, metropolitan transit systems, pipelines, private ambulances, and volunteer fire departments.”) It is therefore clear that the FCC has discretion, if not a mandate, to ensure that utilities have access to spectrum needed to fulfill their critical operational requirements.

Moreover, Petitioners observe that both CTIA and Verizon use the “risk to public safety service providers” as a substantial basis of support for their comments, but that not a single public safety organization filed comments against the Petition.

**V. Equipment Substitutes Are Not Available.**

Opponents paint the plants as arrogant and cavalier about the FCC’s Rules and restrictions. This is false and unfair. Ever since the issue was identified back in 2003, Petitioners and the plants have worked conscientiously and collaboratively with the FCC and incumbent licensees to find a solution to the plants’ pressing requirement for reliable and clear

worker-to-worker communication inside this very challenging infrastructure. In this context, as noted above, the plants have tested every type of equipment they could find (29 separate types of equipment, tested by 55 different plants) in an effort to locate equipment that could served as a replacement for the Telex equipment. Unfortunately, none had Telex equipment's Requisite Performance Features (as detailed in the Petition and in the Proponents Comments) that work so well in the unique and challenging environment found inside the nuclear plants, and that the plants have come to rely upon to help operate safely and enhance worker safety. These findings have been reported to the FCC and are part of the record in this proceeding.

Nevertheless, Opponents continue to blithely challenge Petitioners documented assertions that there is no alternative equipment that has the Requisite Performance Features. EIBASS highlights the fact that SBE advanced several alternatives for consideration back in 2005-2006. What EIBASS fails to mention is that the plants promptly evaluated all of those options (HME, Clear-Com Cell Com, and CATS DWIS) and each was found to be lacking in material ways. It would be nice if finding a replacement for the Telex equipment were as easy as EIBASS says; it is not.

So that there is no confusion, Petitioners provide for easy reference, Attachments B and C to the Waiver Petition, which detail the test results. As further support of the extent to which the plants have gone in an effort to find alternative equipment, below is a list of the 29 types of equipment that have been actively tested by at least one plant:

1. Comtronic Wireless (headsets with built-in radios)
2. Kenwood Walkie-Talkie (hand-held radio)
3. Cisco Wireless Phone, model 7920
4. Vertex model 600

5. Ascom Cell Phone
6. Ascom Wireless Phone System with Kenwood Radios
7. Vega
8. Ericsson
9. Earmark
10. Motorola MTS 2000
11. Panasonic
12. HME
13. Peltor
14. D. Clark
15. Areeva
16. Sound Powered Head Phones
17. Avaya Spectra-Link VoIP Phone System (802.11
18. Site Telephone System
19. Ascom Mini Cell Private Cell System
20. Cattron Theimeg Portable Remote Control System 460 MHz
21. Motorola 9250 900 MHz
22. Nortel Companion Phones
23. Corelar Wireless Phones
24. Spectra-Link PCS Phone System with 451 Motorola 2-Way Radios
25. Eartec Communications Systems
26. Cobalt
27. CATS DWIS (evaluated but formally tested)

28. HME DX200

29. ClearCom Communications CellCom 10 Digital Wireless System

As a further supplement to the descriptions found in the Petition of the shortcomings of these potential “alternatives,” we offer the following data received from the plants regarding the most recent potential “alternatives” suggested by NAB/MSTV, SBE and EIBASS:

A. ClearCom’s CellCom (“CellCom”) coverage inside containment averaged 45%, well below the required minimums for efficient operations. It appears that CellCom’s biggest issue is with buildings with rounded walls (e.g. containment).

B. HME is limited to just 4 belt packs per base station and, while its coverage inside containment was consistently superior to CellCom’s, it operates in the 2.4 GHz frequency, which is the same frequency as the dosimeters which must be worn around a plant worker’s upper body at the same time as the worker has on the Telex headset. As explained in the NEI/UTC pleadings, such simultaneous operation in close proximity would cause interference and possibly completely void both systems. Other objections to HME included lack of range, sound quality and a lack of industrial quality construction. Also, even SBE (in its 2005 Comments) acknowledged that HME would have to be reconfigured in order to be used by the plants, in order to avoid interference with TV BAS Channels. *See* SBE Comments (2005) at p. 11, para 32.

C. One plant offered the following on HME/Cell Com. “We narrowed down to HME and (CellCom’s) ClearComm. With HME (2.4 GHz system) and operating at 802.11, we had interference with other technologies which are using this standard 802.11, such as wireless data network and other systems used during refuel outages. The CellCom 10 Digital Wireless Intercom 1.92 GHZ to 1.93 GHZ frequency bands appeared to be very

flexible, but there was a critical failure in the containment dome at the station tested. Given the structure of the dome, we found 100% packet loss for the digital signal. A frequency engineer from ClearCom was called upon to support the testing, but could not address the issue.”

D. The other “alternative” proposed by SBE/EIBASS is the CAT DWIS product which was not formally tested because the plants must have entirely hands-free operations and CAT DWIS is “virtually hands-free.” Also, the CAT DWIS operates at 2.4 GHz, which as noted above is a non-starter due to multipath challenges presented by the dosimeters that also operate at that frequency.

It should also be noted that the act of testing new equipment in the plant is not a simple matter since one cannot know in advance the level of risk to the plants’ other operations. As such, the testing of potential alternatives must be undertaken with great care and only at particular times when any inadvertent problems created by the testing can be properly managed and contained.

Also, while it should be obvious, perhaps it bears stating that the plants are not telecommunications product developers. Plants cannot simply “will” new equipment to appear. All they can do is exactly what has been done: consistently test each potential technology to see if it can get close to the Requisite Performance Features, while still being operated simultaneously with the dosimeter devices, virtually all of which operate at 2.4 GHz. Given the fact that 29 potential alternatives have been tested by 55 of the plants over the past 4 years, there can be no credit given to the Opponents’ suggestion that the plants are indifferent or complacent about finding a substitute for Telex.

**VI. Opponents Fail to Address the “Regulatory Record” Developed by Petitioners.**

Opponents consistently point to the FCC’s decision in denying Telex’s earlier waiver request, as a basis for denying the instant Petition. This argument fails to acknowledge the extensive “record” developed and presented by the plants over the past four years that not only clearly demonstrates that there is no alternative spectrum or equipment that would work nearly as well, but that also proves that Telex equipment plays a significant role in contributing to plant and worker safety.

Specifically, as noted in the Petition, back in 2004 the FCC rejected the Telex waiver request, which sought similar relief to that requested in the Petition. The FCC found that Telex had failed to provide any proof that (i) there were no Part 90 frequencies, or Part 90 equipment, available that could provide the Requisite Performance Features; and (ii) Telex could not adapt the Part 74 equipment, or develop new equipment, to provide the required communications over Part 90 frequencies. *See Telex Order* at ¶7. The Commission also opined that, in any event, such regulatory relief, if granted, should be granted to the NRC licensee, not to an equipment maker. *Id.* at ¶8.

Over the past four to five years, Petitioners have developed a record in this docket that demonstrates there is no currently available equipment either from Telex or any other manufacturer that is designed to operate on Part 90 frequencies and that offers all of the Requisite Performance Features. In addition, Petitioners also request that each NRC licensee receive its own secondary license, thereby addressing the point raised by the Commission in the *Telex Order*, and also thereby providing a direct contact point for any inquires as well as direct responsibility for the plants to be aware of (and directly responsible for) enforcement of the strict conditions placed on such licenses.



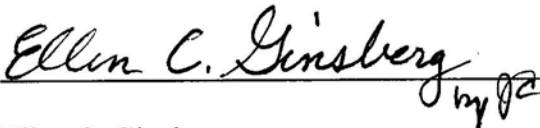
Contrary to what the Opponents imply, the equipment products they suggest do not constitute a showing that there are now substitutes for the Telex equipment. The Petitioners have developed a credible, substantive record on this issue that addresses the Commission's doubts that existed at the time of the *Telex Order*. The fact that at some point in the future, with certain changes in market conditions for these products, substitute equipment could or might become available should not be a basis for the denial of the Petition at this time.

**VII. Conclusion: The Equities Decidedly Favor Grant of Petition.**

Petitioners have supplied the Commission with ample justification for a longer-term authorization to use the Telex equipment. As noted in the Petition, this regulatory relief can be very narrowly fashioned, for just nuclear power generation facilities, and limited strictly to the operations and power levels described herein. Nuclear plant operators' continued need for reliable equipment to perform the tasks described is unquestioned. Not even the Opponents would presume to contend otherwise.

In the final analysis, the Petitioners respectfully submit that the record is clear: there is no alternative equipment available that can provide the plants the Requisite Performance Features. Equally clear is the fact it is necessary to continue to use the Telex equipment – on a secondary, non-interfering basis – in order to maximize the safe operation of nuclear power plant facilities and to protect plant workers from harmful radiation and to comply with NRC regulations. Against these hard facts, Opponents' comments must be seen as failing to rise to the level that would justify denial of the Petition.

Respectfully submitted,

  
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## **ATTACHMENT B**

### "EQUIPMENT ALTERNATIVES" - BY CATEGORY

Based on our research, we see six (6) different categories of communications equipment used widely, in one way or another, throughout the Nuclear Energy Industry ("Industry") facilities in the U.S. for outage and maintenance work in areas where worker exposure to radiation is an issue:

1. VoIP Systems, based on a 802.11 platform (2.4 GHz, non-spread spectrum);
2. Part 90 UHF/walkie-talkies (two-way radios);
3. Private Cell Phone Systems;
4. Wired Telephone Service;
5. 2.4 GHz spread spectrum products;
6. Wireless headsets.

Comments from Industry plant operators and managers demonstrate that none of these "alternatives" can fully replace Telex as a means of achieving reliable, wireless, fully duplex communications necessary for key operating functions in the plants. While Telex is used in the plants, in many different ways, it is most essential in the context of communicating during outage and maintenance situations, when cranes and bridges are moving radiated fuel and spent fuel rods from one part of the plant to another.

Below are all of the quotes (minus the brand names which have been redacted in order to avoid any business tort exposure) from nuclear plant operators and managers in the responses to the NEI questionnaire, which solicited information about the various communications equipment they use, in addition to Telex, or have tested.

1. VoIP/2.4 GHz (non-spread spectrum):

- "Due to the RF propagation characteristics of the 2.4 GHz frequency spectrum, it is very difficult to achieve nearly ubiquitous RF coverage within containment that is required for predictable and reliable communications using VoIP equipment."
- "To achieve a coverage footprint within containment similar to Telex, a higher density of VoIP transceiver equipment would be required in high radiation areas, such as inside the bio-shield wall. This would result in additional radiological dose exposure to employees responsible for implementing the engineering design change for a new wireless communications system, installing the transceiver equipment at the beginning of each outage, and performing maintenance on cabling and/or transceivers in the event of a malfunction during the outage."
- "The VOIP wireless phone system, unlike Telex equipment, is unable to automatically re-establish full-duplex communications without any user action if a user were to momentarily leave and then subsequently re-enter the coverage area. If personnel using the VOIP wireless phone system lose communications due to a momentary loss of

coverage, they must take manual actions to initiate a call and re-establish communications." "This auto-reconnect functionality is vital for the safety of personnel working in high radiation area and other high risk work evolutions where they could be encumbered by protective clothing or equipment they must carry into and out of the work area. The inability to auto-reconnect in a high radiation area could result in additional and unanticipated radiological dose exposure."

- Problems with VoIP phones included the fact that "the equipment operates at 2.4 GHz and has problems with multi-path. Requires the user to hold the phone while in operation. Displays are hard to read in dim light. Noise canceling microphones were not used and background noise and interference was a problem. Battery time limited to about 4 hours of continuous talk time."
- "The VoIP phone was good but would not stay on frequency; antenna's broke very easily; not intended for construction use; no longer supported."
- "The number of VoIP phones usable in containment at one time in a given area may be somewhat limited."
- "Main problem is that these phones drop calls when losing signal or swapping between repeater antennas."
- Problems include: "possible denial of access if cell is full (each cell handles 8 calls at one time); possible call drop due to weak coverage; both denial of access and dropped calls require human intervention in-order to reestablish communications; limited range in the turbine buildings, the diesel building, and the offgas building due to the lack of slotted coax for RF propagation in these areas."

## 2. Part 90 UHF/Walkie-Talkies:

- Negatives noted included "Push to Talk (PTT) radios require user to use one hand to initiate conversations; Poor fidelity in noisy areas; No bridging capability; 4 watt transmitter is a potential source of Radio Frequency Interference (RFI)."
- Uses hand held radios but states that they are "hard to hear in noisy areas. Have to use noise-canceling headsets, provide by manufacturer to attach to radios. These headsets do not eliminate all background noise, still hard to hear in some areas."
- "Hand held radio has an output of 1 watt, which is enough to actuate sensitive instruments if radio is keyed close to instruments."
- "Hand held radios have output of 1 watt this output is strong enough to actuate sensitive equipment. Example: Diesel driven cooling water pumps, when radio was keyed next to diesel it caused overspeed of the diesel."

- "Two-way radios can be used in restricted area but it has dead spots inside the plant and excessive background noise. This equipment "essentially does not meet many of the 12 Telex performance criteria."
- "This equipment could cause workers to spend longer periods in high radiation areas due to not being full-duplex. No central management of the frequencies or intercom groups. No way to patch auxiliary inputs into groups."
- 450 MHz UHF Trunking Radio were ranked fairly high, but noted negatives of "calls getting dropped and lack of background noise rejection." "The radio system is half duplex only."
- Problems include: "there is no hands-free operation feature, which requires the user to key microphone whenever they need to talk. It is a half-duplex system only and the base station only allows one channel operation, which restricts interconnect of multiple systems. High background noise reduces the clarity of communications. Sub-optimal coverage characteristics. The equipment is less durable than Telex headsets and were easily broken if dropped. Breakage of the antennas was common. Size, weight and design of equipment prevented the use of personnel safety equipment (hardhats could not be worn with the units)."
- "The two-way radio system is half-duplex only with a limit of only one person being able to talk at a time, which causes one talker to blank out all others. There is limited coverage within containment when communicating point-to-point using portable radios. The limited background noise rejection of the radio equipment reduces the clarity of communications in high noise areas."
- "Problem is multi-channel cross talk."
- "There is a slight setup delay before communication can commence due to trunking channel assignment. This type of issue can be problematic for crane operations due to delay."
- "Two-way radios are not full duplex, therefore they can't integrate with vendor systems that are normally full duplex Telex type systems."
- "Extremely expensive (\$3K per unit) and does not operate full duplex (a must for many maintenance activities)."
- "A trip (actuation) was attributed to activation of a 450 MHz radio many years ago, prior to the creation of radio exclusion zones."
- "Not powerful enough to transmit through the secondary containment wall but works well outside."
- 450, 800, 900 radio systems installed for site operations. Negatives noted: "not hands free; not duplex; poor audio quality; not easy to use, etc."

- Uses trunked radio system but does not like it because "it is not duplex."
- The walkie-talkie equipment is "not good for safety situations."
- "Equipment (walkie-talkies) is not dedicated and therefore any other radio operator can join the channel and disrupt communications."

### 3. Private Cell Phone Systems:

- Problems identified included: "Multi-user capability required - each user had a separate phone number assigned. Cell sites had limited coverage capabilities due to the design of the system, the operating system frequency and the design characteristics of the containment structure. Cell site loading resulted in dropped calls or in the inability to make calls. Multiple cell sites had to be installed to achieve minimal coverage resulting in increased radiological exposure to the workers installing the system in high radiation areas."
- "Restricted to use outside of high noise areas due to limited background noise rejection capability. Easily broken. Not simple to use since each phone had an assigned number and dynamic lists had to be maintained to track who was assigned a particular phone."
- "Could only talk to one user at a time. Phone was difficult to use while wearing protective clothing."
- "Equipment was packaged poorly and did not stand up to the physical abuse it was subjected to in the Containment environment. RF design was poor and channel frequency drift was common resulting in poor communications. Units were difficult to adjust because RF adjustments needed to be performed in a RF screen room which was not available on site. Frequent shipments of equipment were made to the vendor for simple RF adjustments. This system was abandoned and replaced by Telex."
- Problems with system: "difficult to setup, balance and maintain in Rx. Bldg due to placement of antennae system and to get the communication outside of the Rx Bldg. The durability of the headsets, antennas, etc is not as good as the TELEX belt packs. The system does not integrate with our Audio Matrix. The system cannot be used where you depend on good, constant communications." (Operator no longer uses this equipment.)
- "These require noise-canceling headsets to be effective in some parts of the Plant."
- "Will not interact with Matrix. Affective range determined by antenna placement. Background noise problems resolved by modification. Not highly effective due to structures and configuration."
- "The mini cell system is designed and intended to augment the existing telephone system by adding the features of mobility. Users can still get busy signals when attempting to contact other users. Coverage is subject to installed antennas through the plants. This

system functions the same way a normal cell system does and is subject to the same limitations."

- "In high use areas, users may be denied access due to the limited number of concurrent users allowed to access a single antenna. The handsets do not adapt to high noise conditions or the hands free use."
- "Limited range, static problems, very complicated set up. The system was used during a refueling outage in the 1990's and abandoned during the outage due to lack of functionality."
- Negative comments for "lack of high fidelity/clarity, multi-user, uninterrupted voice transmissions; moisture resistant and durability." Additional problems noted on these systems were "few frequencies available," and "not programmable."
- "There is some drop associated with our cell phones, and re-establishing communications is difficult when the phone is under protective clothing for bagged. The time it takes to re-establish communications had a dose cost in High Radiation Areas."

4. Wired Telephone Service:

- Uses hard-wired communications equipment, for which "the only drawback is it is not wireless."
- "Problem is a hardwire system adversely impacts ALARA. A hardwire system requires installation of approximately 1000 ft of cable for a typical routine outage to support eddy current and reactor coolant pump job coverage. Technicians incur dose during cable installation and un-installation."
- "A hard wire system adversely impacts industrial safety. Personnel must climb over and around equipment to install (and uninstall) the cable. Also, the cable creates a trip hazard when in use."

5. 2.4 GHz Spread Spectrum:

- "We use Telex because multiple channels are necessary to allow more work crews to communicate with each other in high noise/high radiation areas at the same time. Telex's communication equipment does not interfere with existing wireless dosimetry equipment, wireless LAN access points or wireless video used for refueling cameras. Telex actually allows for several channels to be in use simultaneously. Telex operates in a spectrum outside of the 2.4Ghz range where the other equipment operates. This prevents interference between the systems."
- "The problem noted with the 2.4 GHz spread spectrum equipment is that it uses same frequency band as the wireless dosimetry, LAN and video equipment already in use at the plant. There are concerns over interference between the different equipment in places where all of it must be operational (e.g. Refuel Floor)."



- "Radiological safety is enhanced with the ability to communicate with workers in the field while being able to view remote dose and dose rate information from a central monitoring station. The ability to communicate with the worker to reposition their body or to move to a different location saves personnel radiation exposure."
- "Due to construction of Nuclear power plant containment buildings (limited space with stainless steel liner), signals tend to bounce and cause multi-path interference. Higher frequencies seem to be more susceptible."
- Also tested 2.4 GHz spread spectrum phones; graded it highly but stated: "A system was presented with no applications at this time."
- "The radios are untested in an outage environment."

6. Wireless Headsets:

- Problems noted include "tethered headset limits mobility; low audio volume – no volume adjustment; susceptible to background noise."
- Tested wireless headsets and found that "they were not durable. Also, equipment was used for crane operations until the voice drop out (due to lack of full duplex) caused problems for the crane operator."

## **ATTACHMENT C**

### **Summary of 2008 Survey of Nuclear Plant Telex Headset Use**

Below are the results of the plant survey undertaken by NEI, in cooperation with the UTC during the spring/summer of 2008.

Roughly half of the plants have responded to the survey and approximately 10 plants have tested non-Telex equipment. As was the case with the 2005 survey, the plants report a myriad of shortcomings in the equipment they tested as potential alternatives to the Telex Equipment. Among the most common complaints about the non-Telex equipment were (i) interference caused to certain other plant equipment and systems; the coverage area is smaller (and thus not as useful); and the small number of headsets can be used at the same time (and thus not as useful).

A summary of the results is below including a separate section listing the plants' comments regarding their use of non-Telex equipment:

#### **Results Summary**

- 47 of 108 plants responded to the survey.
- No plants are using BTR 600 radios.
- Most plants are using BTR 800, 700 or 200 series equipment.
  - a) 36 plants are using BTR 800 radios; 10 plants are using 1 to 4 radios, 12 plants are using 5 to 10 radios, and 12 plants are using more than 10 radios
  - b) 26 plants are using BTR 700 radios; 10 plants are using 1 to 4 radios, 4 plants are using 5 to 10 radios, and 12 plants are using more than 10 radios
  - c) 20 plants are using Telex BTR 200 equipment; 12 plants are using 1 to 4 radios, 4 plants are using 5 to 10 radios, and 7 plants are using more than 10 radios
  - d) 16 plants are using BTR 300 radios; 7 plants are using 1 to 4 radios, 6 plants are using 5 to 10 radios, and 3 plants are using more than 10 radios
- In the last two years, 26 plants bought more Telex equipment and 10 plants purchased and tested non-Telex equipment.
- The plants reported that they tested five additional potential equipment alternatives (all wireless). For the purposes of this report which will be submitted to the FCC, so as to avoid any issue of commercial disparagement, we shall replace the names of the equipment tested with numbers, 1-5. As each type of equipment is referenced herein, once again numbers, rather than names, shall be utilized.
- Generally, the plants noted that the equipment provided unacceptable voice quality and coverage; caused unacceptable interference to other wireless devices and networks; and does not permit the use of enough headsets at the same time.
- 32 plants use Telex equipment indoors only and 10 plants use Telex equipment indoors and outdoors.

- Telex equipment is used during outages only by 23 plants, 2-3 times per month by 13 plants, 1-2 times per week by 4 plants, and daily by 1 plant.
- 18 plants reported contacting SBE regarding frequency coordination, 12 successfully completed frequency coordination and 6 received no response from SBE.
- Dosimeter interference was reported by 7 plants that tested Alternative #2 and #4 equipment but 16 plants reported no interference.

### **Specific Comments Regarding Problems/Challenges of Using Non-Telex Equipment**

As detailed below in the comments received from the plants, the two primary problems with non-Telex equipment are limited range of use and interference to plant operations.

#### **Capacity and Coverage Problems**

- a) Plant Vogtle, Farley and Hatch, Southern Company; Georgia Power and Alabama Power: Refueling activities require full duplex, immediate response communications that cannot be achieved with push to talk equipment. Other full duplex equipment that has been investigated has capacity limitations with associated access points. Equipment operating at frequencies above 700 MHz do not provide the coverage necessary.
- b) Palo Verde Nuclear Generating Station, Arizona Public Service: The durability and flexibility does not match the TELEX. Also, the non-TELEX units cannot operate enough units at one time.
- c) Davis Besse Nuclear Power Station, First Energy; Fermi 2, DTE Energy / Detroit Edison; River Bend Station, Entergy; and Salem/Hope Creek, PSEG: Lack of range, sound quality, and multipath issues due to 2.4 GHz.
- d) Waterford 3, Entergy: Alternative #1 headsets do not have noise reduction microphones.
- e) Surry, Virginia Electric and Power Company: Alternative #4 equipment provided 80% coverage in containment and Alternative #2 provided 95% coverage in containment. While Alternative #2 provided the best coverage at Surry, the operating frequency of 2.4 GHz is used by other plant devices so this may not be a viable replacement for the Telex equipment. Also, Alternative #2 is limited to 4 belt packs for full duplex operation.
- f) Millstone, Dominion Nuclear Connecticut, Inc.: Alternative #4 equipment provided less than 40% coverage in containment and Alternative #2 provided approximately 60% coverage in containment. Test results indicated that Alternative #4 and Alternative #2 did not provide adequate coverage for refueling operations.
- g) Sequoyah Nuclear Plant, Tennessee Valley Authority: We have not been able to obtain the coverage areas that we currently have with the Telex equipment.
- h) Perry Nuclear Power Station, FENOC: The most significant draw back for non-Telex equipment is the inability to deploy an antenna system to provide adequate reception coverage to support various work groups on independent channels.
- i) Kewaunee, Dominion Energy Kewaunee, Inc.: Alternative #4 provided less than 10% coverage in containment and Alternative #2 provided approximately 40% coverage in

containment. Test results indicated that Alternative #4 and Alternative #2 did not provide adequate coverage for refueling operations.


- **Interference Issues**

- a) Kewaunee Power Station, Dominion: Alternative #4 has signal issues (e.g. interference) in buildings with round ceilings.
- b) Callaway Nuclear Plant, Ameren UE: Non-Telex equipment is not compatible with a digital audio matrix and causes interference to other 1.9 or 2.4 GHz equipment.
- c) Exelon: With Alternative #2 (2.4 GHz system) and operating in 802.11, we had interference with other technologies which using this standard 802.11, such as wireless data network and other systems used during refuel outages, and did no formal testing. We did test Alternative #4's 10 Digital Wireless Intercom 1.92 GHZ to 1.93 GHZ frequency bands in November of 2007. The system appeared to be very flexible, but there was a critical failure in the containment dome at the station tested. Given the structure of the dome, we found 100% packet loss for the digital signal. A frequency engineer from Alternative #4 was called upon to support the testing, but could not address the issue. We are not optimistic that we will be successful in finding an alternative for a wireless intercom solution which can be effectively used in the plant environment at our stations. A long-term alternative would be to move to an in-plant communications system, which leverages voice over IP. Moving in this direction will take time and is expensive, as well as may not be technically feasible in some areas of the plant environment.
- d) Prairie Island Nuclear Generating Plant, Xcel Energy: Interference with sensitive instrumentation, unable to cope with high-noise environment, are all issues with non-Telex equipment
- e) Wolf Creek Generating Station, Wolf Creek Nuclear Operating Corporation: Non-Telex equipment will not work on refueling floor or in reactor head area due to multipath distortion from reflections from containment dome.
- f) Harris Nuclear Station, Progress Energy: Frequency of non-Telex equipment does not work well in containment.
- g) Naesco: Non-Telex equipment limited on number of users and unacceptable interference.

**CERTIFICATE OF SERVICE**

I, Juanda Joyner Johns, a legal secretary at the law firm of Thompson Coburn, LLP, Washington, DC, hereby certify that on this 5<sup>th</sup> day of November, 2009, a copy of the foregoing "REPLY COMMENTS OF THE NUCLEAR ENERGY INSTITUTE AND UTILITIES TELECOM COUNCIL" is being sent via U.S. mail, first class postage paid, to the following:

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